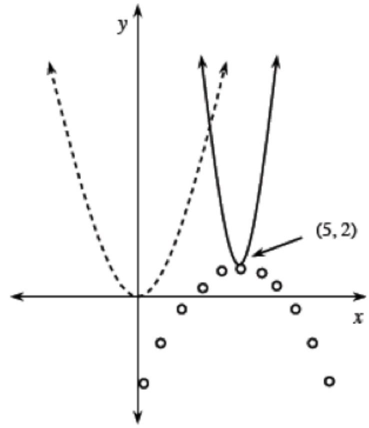
Alg. 2 Warm Up # 7-1

1. The graph of $y=x^2$ is shown as a dashed curve at right. Estimate the equations of the two other parabolas.



2. Find the x- and y-intercepts and the vertex of $y=x^2+2x-80$. Then sketch the graph and write the equation in graphing form.

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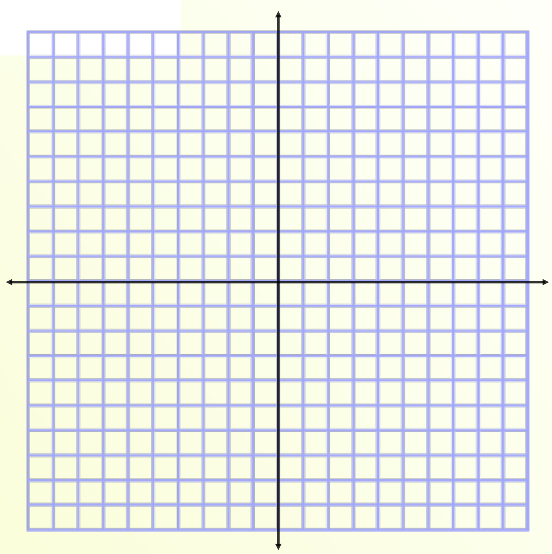


Pink WS

1) (9,4) & (3,7) $\rightarrow$ $m = \frac{\Delta y}{\Delta x} = \frac{7-4}{3-9} = \frac{3}{-6} = -\frac{1}{2}$

$y - 4 = -\frac{1}{2}(x-9)$

$y - 7 = -\frac{1}{2}(x-3)$

$d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$

$d = \sqrt{(9-3)^2 + (4-7)^2}$

$d = \sqrt{6^2 + (-3)^2}$

$d = \sqrt{36+9}$

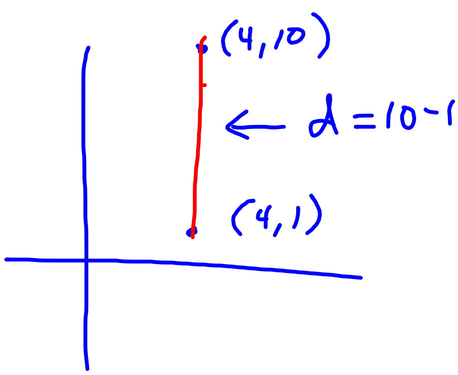
$d = \sqrt{45}$

$d = \sqrt{9}\sqrt{5}$

$d = 3\sqrt{5}$

3) (4,1) (4,10) $\rightarrow$ $m = \frac{1-10}{4-4} = -\frac{9}{0}$

m is undefined.



line: $x = 4$

$d = 9$

5c) $$\left[\frac{6x^5}{xy^{-2}}\right]^{-2} = \left[\frac{6x^4y^2}{1}\right]^{-2}$$

$$= \frac{1}{36x^8y^4}$$

Or:

$$= \frac{6^{-2}x^{-10}}{y^4x^{-2}}$$

$$= \frac{x^2}{6^2y^4x^{10}}$$

$$= \frac{1}{36x^8y^4}$$

5a) $$\left(\frac{8}{27}\right)^{-1/3}$$

$$\left(\frac{27}{8}\right)^{1/3}$$

$$\frac{\sqrt[3]{27}}{\sqrt[3]{8}}$$

$$\frac{3}{2}$$

8) $9k^2+66k+21$

$3(3k^2+22k+7)$

$3(3k+1)(k+7)$

7) $7a^2+53a+28$

$(7a+4)(a+7)$

$1 \cdot 28$

$2 \cdot 14$

$4 \cdot 7$

Salmon CP's from Friday:

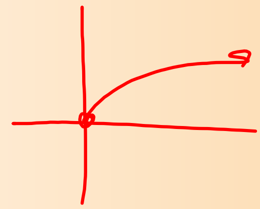
Family name, general equation and meaning of (h, k)

$y = x^2$

$(h, k) \rightarrow$ vertex

$y = \sqrt{x}$

$(h, k) \rightarrow$ starting point



$y = \frac{1}{x} \longrightarrow y = a\left(\frac{1}{x-h}\right) + k$

hyperbola

$(h, k) \rightarrow$ intersection of the asymptotes.

$y = x$

line

$$y = a(x-h) + k$$
$$-k \qquad\qquad -k$$

Just like point slope form of a line!

$$y - k = a(x-h)$$

$$y - y_1 = m(x - x_1)$$

(x_1, y_1) is any point on the line

(h, k)

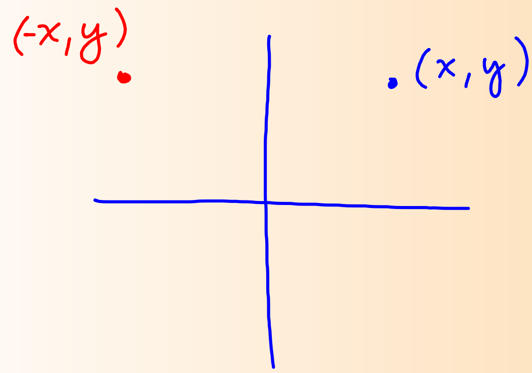
Meanings of "a"

$a > 1$ vertical stretch

$0 < a < 1$ vertical compression

$a < 0$ reflected over the x-axis

Investigation: y = f(-x)



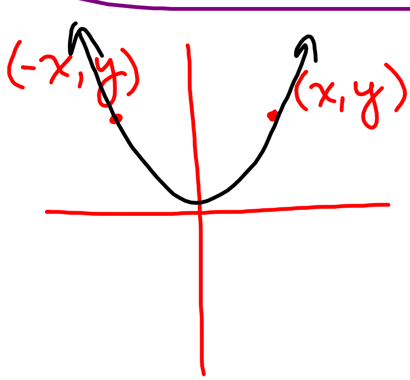
Notes:

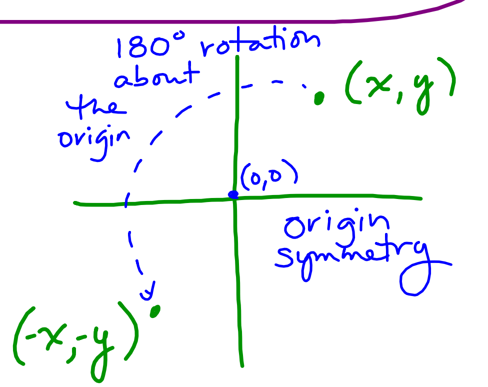
Even: f(-x) = f(x) -x gives you the same outcomes as x

y-axis symmetry

Odd: f(-x) = - f(x) -x gives you the opposite outcomes as x

Origin Symmetry





Even: $f(-x) = f(x)$ — $-x$ gives you the same outcomes as x

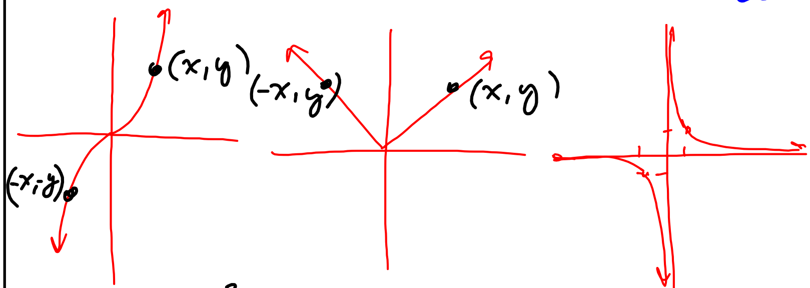
Odd: $f(-x) = -f(x)$ — $-x$ gives you the opposite outcomes as x

Odd, Even or neither?

odd.
$y = x^3$

$y = |x|$ even

$y = \frac{1}{x}$ odd



$y = (-x)^3$

$y = -(x^3)$

CP's: #123 Sort:

Even	Odd	Neither
$y=\|x\|$	$y=x^3$	$y=2^x$
$y=x^2$	$y=\frac{1}{x}$	$y=\sqrt{x}$
	$y=x$	

Math Notes

Methods and Meanings

p. 98

General Equations for Families

add the meaning of (h,k) for each family.

If $y = f(x)$ is an equation for a parent graph, then the general equation for the family of functions with similar characteristics as $f(x)$ can be written as:

$$y = a \cdot f(x-h) + k$$

Where (h,k) is the point corresponding to (0, 0) in the parent graph and, relative to the parent graph, the function has been:

- Vertically stretched if the absolute value of a is greater than 1.
- Vertically compressed if the absolute value of a is less than 1.
- Reflected across the x-axis if a is less than 0.

So far in this chapter you have worked with the following families of functions:

Parent	Family	General Equation
$y = x$	Line	$y = a(x-h)+k$
$y = \lvert x\rvert$	Absolute Value	$y = a\lvert x-h\rvert+k$
$y = x^2$	Parabola	$y = a(x-h)^2+k$
$y = x^3$	Cubic	$y = a(x-h)^3+k$
$y = \frac{1}{x}$	Hyperbola	$y = a(\frac{1}{x-h})+k$
$y = \sqrt{x}$	Square Root	$y = a\sqrt{x-h}+k$
$y = b^x$	Exponential	$y = ab^{(x-h)}+k$

HW: 2-

125 ---> 131

Short Quiz Thursday
* Parabolas, finding special points
* Solving with x in the denominator